

# AIR QUALITY

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BULLETIN

## HEALTH POLICY

### Public health to include air?

Government public health proposals could have major implications for air quality and other environmental health functions. They will 'empower' local government with new resources, rights and powers to shape the environment.

Public health will be taken away from central government and handed to local authorities. Public health was historically the remit of local authorities, at the moment it is coordinated centrally through the Health Protection Agency and NHS primary care trusts.

The plans are contained in a White Paper which will form the basis of a Health and Social Care Bill. It includes much talk of localism and using 'nudges' to change behaviour rather than obligation. Public Health England will oversee local efforts.

"We will end central control and give local government the freedom, responsibility and funding to innovate and develop their own ways of improving public health in their area. There will be real financial incentives to reward their progress on

improving health and reducing health inequalities."

There will be ring fenced public health funding, this is estimated to be worth £4bn a year, given to upper tier and unitary local authorities. There will be a health premium to reward them for progress made, for instance reducing health inequalities.

It says: "Local government, including county, district and parish councils, already play a significant role in protecting and improving the health of its communities through for example environmental health, air quality, planning and transport. Local councils (districts where two tier) will continue to carry out their statutory duties under the 1984 Public Health Act. The Bill will provide that upper tier and unitary local authorities will have a duty to take steps to improve the health of their population from 1st April 2013."

The White Paper notes: "The quality of the environment affects any community: pollution, air quality, noise, the availability of green and open

spaces, transport, housing, access to good quality food and social isolation all influence the health and wellbeing of the local population.

"Climate change represents a challenge in terms of long term health services' planning and emergency preparedness."

The switch is likely to be welcomed by many environmental health officers that have been frustrated at the unwillingness of primary care trusts to fund air quality measures. There is evidence that some interventions – for instance airtext alerting services – have an enormous benefit in reducing health costs by reducing pollution exposure to those with respiratory problems.

Ed Dearnley of Epuk commented: "Bringing public health into local authorities will reinforce the need to act on poor air quality and other environmental areas, i.e. they'll have both the duty (LAQM) and public health remit to act."

● The White Paper, *Healthy Lives, Healthy People*, can be downloaded on: [www.dh.gov.uk/healthypeople](http://www.dh.gov.uk/healthypeople)

## LOCAL TRANSPORT

### 20mph improve safety and air quality

A road safety group claims that 20mph speed limits do not worsen air quality.

Campaign group *20s Plenty for us* says: "Many people assume that at lower speeds extra fuel is used and more pollution created. In fact the reverse is true. That's why *Total 20 without traffic calming*, is supported by so many environmental organisations.

When 20mph zones were introduced in Germany, car drivers changed gear 12% less often, braked 14% less often and required 12% less fuel.

"Most Continental European towns enjoy a 20mph limit which supports road safety and sustainable transport. Stop/go driving is typical in urban areas. Distances drivers could legally and safely go at 30mph is

limited by traffic lights, crossings, congestion, junctions and pedestrian and cyclist numbers.

A report from Belgium concluded: "It is unlikely that imposing strict speed limits in urban areas has a significant influence on emissions of NO<sub>x</sub> or CO<sub>2</sub>."

● More details see website [www.20splentyforum.org.uk](http://www.20splentyforum.org.uk)

## IN BRIEF

### Busy traffic may cause asthma: Comeap

The Committee on the Medical Effects of Air Pollutants (Comeap) has accepted that busy traffic may cause – not just worsen – asthma.

The new statement accepts that those living near busy roads may be more likely to get asthma in the first place. Comeap's previous position (in 1995) was that there was insufficient evidence to suggest that pollution may be causal.

Comeap now concludes that it is unlikely that exposure to outdoor air pollutants causes asthma in the *general* population. But it is "possible that in a small group of those who suffer from asthma, who also live near busy roads, exposure to traffic generated air pollutants, largely from trucks, may have played a small part in causing their disease".

Professor Jon Ayres, chairman of COMEAP, said: "Although there are many possible risk factors, some of which might act together to cause someone to develop this disease, the conclusions that outdoor air pollutants might have a role in causing asthma in some individuals living near busy roads represents a modest change from the Committee's view given in 1995.

"It remains clear, however, that those who already have the disease can suffer exacerbations as a result of air pollution exposure and so continued efforts to reduce air pollution levels will help those with asthma in general."

More details next month. ● The statement (*Does outdoor air pollution cause asthma?*) and its supporting papers are available on the Committee's new website: [www.comeap.org.uk](http://www.comeap.org.uk)

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## IN BRIEF

### Scottish biomass

A Scottish version of Epuk's *Biomass and air quality guidance for local authorities* has been published.

It is based on the English and Welsh version but reflects different regulations north of the border.

The guidance provides background material on the issues involved, and details procedures for assessing and managing the effects of biomass on air quality – specifically nitrogen dioxide and particulates (PM<sub>10</sub> and PM<sub>2.5</sub>). A number of tools are also available to help local authorities assess the potential impacts of biomass boilers and keep records of installed boilers.

● *New biomass and air quality guidance for Scottish local Authorities* [www.environmental-protection.org.uk/news/detail/?id=2700](http://www.environmental-protection.org.uk/news/detail/?id=2700)

### Filters for light trucks

Eminox has designed a diesel particle filter for vehicles whose engines may not warm up enough to make a conventional trap work properly.

Eminox's ART technology is being developed to cut particles in low temperature applications. The full-flow burner technology is a complete system which uses a robust silicon carbide filter, housed in a compact modular stainless steel unit, is also being developed for the retrofit market.

Standard DPF (diesel particulate filter) technologies cannot regenerate at low temperatures. However, with ART technology, effective filter regeneration can be achieved from 150 deg C.

The ART technology has fully automated regeneration via a dynamic electronic control unit which helps to maintain low back pressure. ART does not require user intervention, has minimal impact on normal vehicle operations, and low impact on fuel consumption.

Optimum flow and temperature distribution delivers uniform regeneration and avoids damage to the filter.

## ACTION PLANNING

# TfL trials dust suppressant

Trials have now started on using road sweeping and dust suppressants to reduce PM<sub>10</sub> in London hotspots.

The measure is contained in the Mayor's air quality strategy which includes specific measures to tackle a handful of roads where there are exceedances (*AQB October p3*).

Use of road sweeping and street washing is common on mainland Europe but there is considerable debate about whether there are meaningful and lasting improvements. Some manufacturers believe that no meaningful reductions will take place unless more sophisticated PM<sub>10</sub>-compliant sweepers are used.

TfL is running the trial through its road agent Jacobs. Three machines have been converted to sweep and spray calcium magnesium acetate. TfL says: "This literally sticks the particulate matter to the carriageway and prevents it recirculating in the air. It is a biodegradable saline solution that will be sprayed in very small amounts, evenly on roads in the two trials sites."



A converted gritter will be used to spread the CMA suppressant

"As part of the trial the carriageway is first swept and jetwashed by a machine similar to a road dust sweeper and then the solution is applied by a modified winter gritting machine that has a very fine sprinkler-like system attached to it."

It will be applied several times a week as deemed necessary in the early hours. The £300,000 trial will last for six months and is hoped to reduce PM<sub>10</sub> by 10-20 per cent where the technique is used.

The two sites being treated under the trial are:

- A3211, from Waterloo Bridge through Victoria Embankment, Upper Thames Street ending at Tower Hill;
- A501, Marylebone Road and Euston Road from the A5 Edgware Road to York Way at King's Cross station.

Mayor of London, Boris Johnson, said: "We have scoured the globe to find new ways to tackle pollution and found this wonderful contraption that tackles air quality head on, sticking particles to the roads' surface and preventing their dastardly escape back into the air we breathe. We expect this new measure to have an immediate impact on air quality in the most polluted areas of central London."

The trial will be monitored although TfL is using existing monitors that are in place. Frequencies and timings of applications will be trialled to see if it makes a difference.

But Dulevo, a manufacturer of roadsweepers that are claimed to remove PM<sub>10</sub> more efficiently says that TfL has refused to speak to it about its equipment. It claims that its sweepers can cut PM<sub>10</sub> by 15% as well as smaller fractions in an urban environment.

"They are certificated by TUV and DNV testing authorities to stop more than 99% of PM<sub>10</sub>, 98% of PM<sub>5</sub>, 92% of PM<sub>2.5</sub> and 63% of PM<sub>1</sub> using Goretex filters to remove dust." The manufacturer claims that conventional sweepers simply recirculate much of the PM.

## CEMENT PROTESTS

# Rugby caught on camera



Rugby cement protester Lillian Pallikaropoulos has been back in the Supreme Court.

Pallikaropoulos has been fighting authorities over permitting of the Rugby Cement plant (*AQB August 2008 p4*). She is arguing against costs of £86,000 awarded against her. She says the massive costs deny her rights to justice as set out in the Aarhus convention (*AQB September p3*).

● Last month Pallikaropoulos pictured the plant apparently having difficulties (see left). She says much of the site's problems stem from underestimation of low level point sources ie dust that isn't from the main stack.

## POLICY

## Few surprises in AQ defence

The Coalition Government has responded to the hard hitting Environmental Audit Committee report into air quality released earlier this year (*AQB April p8*).

That report criticised the pace and scale of Government efforts to tackle poor air quality, now the Government has issued its response. While the response contains little in the way of new policy (*see feature, page 8 for more detail*), it is the first time that the air quality policy has been restated since the new Government took office.

The response has been criticised as weak by Simon Birkett of the Campaign for Clean Air in London. Birkett said: "This is a real muddle. Ministers think they can choose when they comply with public health laws: 'Government intends to comply with Community law and to avoid

infracture and any fines that could result.' 'Coalition agreement includes the commitment to work towards full compliance with EU air quality standards.' Which is it – comply now or comply never?"

Birkett continued: "This response looks part of a last ditch desperate effort by the Government to persuade the European Commission to allow it a time extension until 2011 to comply with the daily PM<sub>10</sub> limit. Surely the Commission won't be persuaded. Yet again we are told there is 'work in progress' but there is still nothing new or tangible from the Government.

"Will Government delegate authority and resources to the Mayor and local authorities along with responsibility? Or is 'Big Society' about cost-cutting at the centre and passing the

buck? Who's in charge? The Government implies the Mayor and London boroughs have full responsibility for complying with health-based air quality laws but a letter from Defra to CAL dated 20 July 2010 admits 'the Secretary of State has overall responsibility for compliance with EU air quality limits'. Without clear responsibility and matching authority and resources at every level of Government this muddle is going to get worse.

"Clean Air in London urges the European Commission to waste no time in escalating legal action against the UK for breaching health-based laws for PM<sub>10</sub> and NO<sub>2</sub> since January 2005 and 2010 respectively." He is urging the Environmental Audit Committee to look again at the issue of air quality in the light of this response.

## PERMITTING

## Tighter odour standards for sewage works?

Waste water developments could be subject to tighter standards in the future.

A draft National Planning Statement on waste water policy sets out odour standards of 1.5 odour units/m<sup>3</sup> – in the past water firms have been used to working to a standard of about 5-10 OU/m<sup>3</sup>.

The statements are being released as big planning is put into the hands of Government, initially through the Infrastructure Planning Commission, then ministers.

Large infrastructure projects will have to conform to NPS's which will then exempt them from statutory nuisance action once built. But this means they need to be built in a way that they are not annoying in the first place. The draft says: "Because of the availability of

the defence of statutory authority against nuisance claims, the IPC should not grant development consent unless it is satisfied that all reasonable steps have been identified, and will be implemented throughout the operational lifetime of the project, to minimise detrimental impact on amenity from odour emissions." If the IPC is not satisfied on this point, it can reduce the scope of the defence or remove the defence entirely through a provision in the development consent order.

In more detail, it says "Odour impacts should be assessed using appropriate and objective odour impact standards, such as those set out in the Environment Agency's Technical Guidance H4, or relevant industry guidance. The impact exposure standard expected to be applied

at sensitive receptors such as housing, hospitals and schools should be a 98th percentile hourly average odour exposure no higher than 1.5 OU/m<sup>3</sup>.

The odour impact risk assessment should include consideration of ancillary activities associated with the project, for example, transport of sludge; and the effects of abnormal operations (e.g. a major plant failure) and emergencies such as loss of sludge disposal route.

Where the development leads to a deterioration in air quality in sensitive area, or a substantial change, then the IPC should give air quality considerations 'more weight'.

● *Consultation on the draft national policy statement for water* [www.defra.gov.uk/corporate/consult/waste-water](http://www.defra.gov.uk/corporate/consult/waste-water)

## PLANNING

## Community Infrastructure Levy is confirmed

The Government has confirmed that the Community Infrastructure Levy will be retained. It was introduced as part of the 2008 Planning Act, but put under review.

Guidance has now been issued confirming that the levy

will continue and formalising the status of complementary planning obligations (section 106 agreements).

The levy will be paid by developers and used for infrastructure. Planning obligations will continue to be

used for other purposes – in the past they have been used to fund air quality monitoring.

● The Community Infrastructure Levy can be viewed on [www.communities.gov.uk/publications/planningandbuilding/cilssummary](http://www.communities.gov.uk/publications/planningandbuilding/cilssummary)

## IN BRIEF

### Reviewers chose to review modelling

Prof Martin Williams, formerly head of air quality of Defra and now at Kings College London, has been appointed to head up the steering group set up by Defra to oversee the air quality modelling review (*AQB September p3*).

The group also includes Prof., Duncan Laxen of Air Quality Consultants, Roger Barrowcliffe of ERM and Paul Monks of Aqeg. It will take account of ongoing model intercomparison studies to help advise Defra on appropriate models.

### Emission factor update

Defra and the regions have provided an updated Emission Factors Toolkit (Version 4.22) based on 'new' 2009 vehicle emissions factors.

The toolkit allows users to calculate vehicle emissions for multiple road links based on vehicle fleet composition, traffic speeds and road type. The toolkit produces link-by-link source apportionment covering vehicle exhaust emissions, including brake and tyre wear contributions for PM<sub>10</sub> and PM<sub>2.5</sub>.

● The toolkit can be downloaded on <http://laqm1.defra.gov.uk/review/tools/emissions.php>

### Bias adjusted

The latest national bias adjustment factor spreadsheet (v.09/10) is now available and can be found in the usual place in the LAQM tools section <http://laqm1.defra.gov.uk/review/tools/no2/baf-national.php>.

● The precision summary for each laboratory for 2008/9 has also been updated and is available on the precision and accuracy page <http://laqm1.defra.gov.uk/review/tools/no2/precision.php>.

### Cities ranked

Cities have been ranked in terms of the general environmental attributes – and air quality specifically.

● The sustainable cities index 2010 can be viewed at [www.forumforthefuture.org](http://www.forumforthefuture.org)

## IN BRIEF

### Data captures drops below 90%

Particle monitors are still playing up in the Automatic Urban and Rural Monitoring Network (AURN).

In a newly released report summarising the second quarter of data capture from the network monitors in 2010, AEA reports 42 sites (out of 134) not meeting the 90% data capture requirement. PM<sub>10</sub> monitors are continuing to give problems which have been highlighted in previous reports (*AQB July 2009 page four*).

It is the particle monitors that are dragging down the overall network performance – PM<sub>10</sub> data capture in the second quarter was 81%, PM<sub>2.5</sub> was 84%.

In recent years Defra and the regions have replaced Teoms with FDMS instruments which have had teething problems. It is understood that operators are disappointed at continuing problems, but point out that the FDMS's are producing far more detailed information which is highlighting errors – previously errors may not have been picked up.

● *QA/QC data ratification report for the automatic urban and rural network, April-June 2010* can be viewed on [www.airquality.co.uk/archive/reports](http://www.airquality.co.uk/archive/reports)

### Enviros addition



Dr Alun McIntyre has recently joined SKM Enviro as technical lead – air quality.

## WEBSITES

# New website for London

The LondonAir *Nowcast* has been launched as part of an updated LondonAir website.

The LondonAir *Nowcast* uses a combination of measured and modelled NO<sub>2</sub> and PM<sub>10</sub> concentrations to produce a 20m resolution map of air pollution in the capital each hour. *Nowcast* maps initially focused in central London can now be used anywhere within the M25.

The new LondonAir site also displays the latest measurements at over 100 monitoring sites in London and the south east using an updated map interface. There have been improvements to the graphing functions to improve viewing of measurements over the last week, month or chosen time period – or compares to UK air quality strategy objectives.

400 million measurements of air pollution in London

spanning nearly 20 years can also be downloaded directly into the free, open-source data analysis tools provided by the NERC OpenAir project.

Gary Fuller of ERG says: “This update is part of our longer term ambition to improve the LondonAir site for scientists and air quality professionals

and, importantly, to improve the information that we provide to Londoners and those living in the south east. The release today includes new features and we are working on a comprehensive redesign to be released during 2011.

● [www.londonair.org.uk/london/asp/nowcast.asp](http://www.londonair.org.uk/london/asp/nowcast.asp)

## Smart and tweeting

The *Airtext* air quality forecasts for London are now published on Twitter and as an RSS feed.

A smart phone application is also being developed. *Airtext* is run by Cerc for London authorities (while ERG runs the *Airalert* service for other southeast England authorities).

*Airtext* forecasts are “tweeted” daily at about 8am

through the Twitter name @airTEXT. Cerc is developing a smart phone application for the forecasts. The latest forecast will always be displayed on the phone's home screen with simple wording and colour-coding so the latest forecast is available at a glance. The forecast app will be a free download for Android phones.

● [www.airtext.info](http://www.airtext.info)

## EPISODES

# Fireworks night leads to particle peaks

Wet and windy weather prevented a build up of pollution on bonfire night, but on the following day, more settled conditions led to peaks.

ERG says many sites have measured daily mean PM<sub>10</sub> particulate above the EU limit value concentration of 50µg/m<sup>3</sup> on both 6th and 7th November; 39 sites measured daily mean concentrations above 50µg/m<sup>3</sup> on 6th November and 47 sites on 7th November. Two London sites were in the very high band.

In recent years, Guy Fawkes night has often prompted alerts. Around Guy Fawkes Night, 2007, very high PM<sub>10</sub>

particulate was measured at three sites in London and very high PM<sub>10</sub> particulate was also measured around Guy Fawkes night in 2001, 2002 and 2006. In years where Guy Fawkes night falls midweek, celebrations are more likely to be spread across weekends. However this year, both Guy Fawkes night and Diwali were on a Friday and this may have contributed to the widespread pollution episode.

Outside London and the south east, high PM<sub>10</sub> particulate was measured in Leicester and moderate PM<sub>10</sub> particulate was measured in Leeds, Nottingham,

Chesterfield and Stoke-on Trent.

For the second year in a row, Scotland experienced cold wintry, still conditions during Guy Fawkes night.

Throughout Scotland a peak in PM<sub>10</sub> and PM<sub>2.5</sub> was recorded during the evening of the 5th November. Though not reaching even the moderate banding level, the event can be easily seen across the whole network.

AEA says that this year there was good data capture during this event. Through the Scottish air quality forum, AEA advised local authorities not to change filters in FDMS analysers prior to bonfire night.

# Another moderate episode for London

Widespread moderate PM<sub>10</sub> particulate was measured across London on Tuesday 16th November.

It affected 17 roadside sites and three industrial sites. More importantly from an exposure perspective, reports ERG, moderate PM<sub>10</sub> also spread away from road and industrial sources to affect areas of inner

and east London with moderate concentrations being measured in background locations in Bloomsbury, Islington, Kensington, Tower Hamlets and Waltham Forest.

Moderate levels of NO<sub>2</sub> were also measured alongside three busy roads in Kensington, Lambeth and Tower Hamlets. Two sites in Putney, Wands-

worth also breached the high threshold during the afternoon.

This PM<sub>10</sub> and NO<sub>2</sub> pollution episode was mainly due to poor dispersion of air pollution emitted from within London. A change in wind direction and increase in wind strength during the early evening bought about a rapid dispersion of air pollution across the region.

**NEWS FROM EPUK'S AIR QUALITY UPDATE CONFERENCE HELD IN BIRMINGHAM LAST MONTH**

# No to LEZ's, says Laxen

Air quality guru Duncan Laxen has suggested that low emission zones may not help air quality.

Laxen, who until recently provided policy support to both Defra and the GLA as part of the helpdesk contracts, was outlining actions that could be taken to tackle air quality hotspots in London. He explained to the Epuk audience the contents of two reports on NO<sub>2</sub> and PM<sub>10</sub> hotspots released last month (*AQB October p8*).

The hotspot reports listed measures that do work – such as effective policing of red routes and use of cleaner buses – and also measures that “may not help”:

- Low emission zones if based on encouraging Euro 3, Euro 4 or Euro 5 vehicles;
- Park and ride – unless based on genuinely clean buses (as you cannot rely on Euro Standards) and there is a danger that to provide a regular service you end up with empty buses running through the day;
- Eco driving – unless well thought out – the focus is

currently on CO<sub>2</sub>; and

- Photo catalytic coatings.
- Laxen explained that findings from David Carslaw, which are due to be included in a report soon to be handed to Defra, show that modern vehicles are not yielding the emission improvements they were supposed to, including on NO<sub>x</sub>. As such, low emission zones will not deliver the savings they were promised.

Only if Euro 6 were specified is there likely to be an improvement (as Euro 6 will try to plug the gaps in emissions type-approval process). But he warned that there is no guarantee that even Euro 6 will yield the promised benefits, and as the technology is not yet in widespread use, it would be very hard for any LEZ to require Euro 6 standards.

“We have been let down by national standards not delivering and Europe not delivering effective standards – they have been overly-influenced by the motor manufacturers and delivered standards that they

can meet rather than forcing improvement. And the DfT has taken its eye off the ball – if it ever had its eye on the ball – and allowed manufacturers to get away with test cycles that don't deliver improvement.”

Emissions trap manufacturer Mike Galey of Eminox said that tailored use of traps can yield 70% reductions in NO<sub>x</sub> with real world vehicles on real world city streets, with ultrafines cut by two orders of magnitude. Laxen said that he remained to be convinced. Galey responded: “Tailored tailpipe solutions will deliver emission savings – but I agree legislative cycles are a bit of waste of time.”

Defra's Robert Vaughan, speaking at the same conference, suggested the Government was beginning to accept that vehicle emission improvements were disappointing: “Evidence is getting stronger that Euro standards haven't delivered NO<sub>x</sub> reductions from diesel vehicles so far.”

## After the cuts

Cuts and localism go hand in hand, Cassie Harrison told the Epuk conference.

Harrison, of Local Government Regulation (formerly Lacors) provided further detail of the impact of current changes to funding and organisation of local government. She said that real-terms reductions of 28% over the next four years in local authority spending would be significantly front loaded, with capital spending cut by 45%.

But she welcomed increased flexibilities. Grants totalling £7bn have been freed from ring fencing, there will be less data collection burdens and reporting, for instance local area agreements and national indicators are likely to go. She said that central reporting burdens cost local government £300m a year.

But against that she said: “But if local power is increased, how are we going to engage with these people on local air quality management. More and more if local communities care, then councillors care, so greater communication on a local level is needed. We need to get better at communicating with the public and local politicians.”

## Compliance thoughts

The European Commission is looking at a strategy that will try to ensure better compliance with environmental laws.

20% of infringement actions relate to the environment, the *Communication on implementing EU environmental law and policy: a common challenge* seeks to “address the shortcomings in implementing environmental legislation and propose a strategic way forward as well as exploring a number of practical avenues to improve the current gaps in implementation”.

- [http://ec.europa.eu/atwork/programmes/docs/cwp2011\\_annex\\_en.pdf](http://ec.europa.eu/atwork/programmes/docs/cwp2011_annex_en.pdf)

## LONDON

# Low emission strategy: UK first for Devon?

Mid Devon's Simon Newcombe claimed a possible UK first for managing to combine a low emission strategy into the district's Local Development Framework (LDF).

The LDF builds on adopted core strategy policies and introduce low emission strategies into policy for all major developments up to 2026. Mid Devon was one of the first to include low emission principles into its core strategy which enabled contributions of more than £1m for a supermarket development in Crediton. The low emission charges were tested by the courts and were found to be legally watertight (*AQB October 2009 p1*).

The council's Simon Newcombe told last month's Epuk air quality update

conference held in Birmingham that the concept was being introduced for the Tiverton Eastern Urban Extension – earlier air quality successes focussed on developments in Cullompton and Crediton.

He said: “The problem is that your council may be proposing significant new development and actual or potential air quality issues will not necessarily prevent allocations being adopted or sterilise development. Traditional piecemeal air quality impact assessments tend to be notorious for finding ‘negligible’ impact and are often not able to deal with cumulative impact.

He continued: “If you are keen to ensure that air quality is built in to the wider plans as

opposed to being ‘assessed out’ or at best bolted on, with a focus on mitigation, then building low emission strategies into LDF policies can provide a solution.”

Newcombe explained that Mid Devon's allocations and infrastructure development plan document was drafted last year but only adopted last month. It contains all site allocations through to 2026 and sets overarching policies including climate change and low emission strategies. “We think this is the first in the UK, and it offers an example for proactively managing future local air quality alongside greenhouse gas management. Think low emission strategies rather than impact assessments and manage your emissions!”

# Government responds to MPs

The coalition government has responded to a Parliamentary report that criticised UK air quality policy earlier this year

In March this year MPs said the UK should be “ashamed” of its record on air quality.

While that damning indictment might serve as an ‘end of term report’ on the Labour Government’s air quality policy, the incoming Coalition Government has calmly picked through the recommendations and restated how its current policy will address the problems. The theme of the Government’s response is very much business as usual – although littered with many hints of the move towards localism.

The MPs’ report released earlier this year was based on research and a number of hearings which studied progress on air quality (*AQB April p8*). The House of Commons Environmental Audit Committee had ten key conclusions now considered by the new Government.

One of the key messages of MPs was on the relative importance of air quality: “Poor air quality probably causes more mortality and morbidity than passive smoking, road traffic accidents or obesity. Yet it receives little or no attention in the media and scant attention in Parliament and within Government. Poor air quality reduces the life expectancy of everyone in the UK by an average of seven to eight months and up to 50,000 people a year may die prematurely because of it. Air pollution also causes significant damage to ecosystems. The UK should be ashamed of its poor air quality and the harm this causes.

“It is likely to breach EU air quality

directives. The fines for doing this could be significant. The costs to the country of air pollution are enormous, more comprehensive cost benefit analysis should drive both changes in policy and better implementation of existing policy. It could also find the most cost effective way of complying with the existing legal limits.”

MPs added that local authorities have a key role in delivering improved air quality. They need better support from across central government to achieve this.

Harsh words. And on the latter point, the incoming Government’s central plank (apart from obvious spending cuts) is to reduce central government support to local authorities, not increase it.

The response starts very positively: “The Committee’s inquiry focussed on what had been achieved in the lifetime of the previous UK Government. While significant improvements have been made in air quality over many years, the present Government takes the view that more needs to be achieved. Securing further improvements is one of the Coalition priorities; and the Coalition Agreement includes the commitment to work towards full compliance with EU air quality standards.”

Then it talks about money and localism: “The wider economic and fiscal situation will also be an important factor, which will impose considerable limits on the scope for measures involving public spending. A further consideration will be the Government’s broader aim of taking power

away from Whitehall and putting it into the hands of people and communities and reducing regulatory burdens.

“In creating a framework of greater freedom for local councils, the need to maintain minimum environmental standards in air quality remains. Government will be reviewing in more detail how the role of local authorities on air quality can be maintained and enhanced in the light of its broader commitment to localism and the changes to regulation and local structures that are currently being addressed.”

Policy advisors have flagged up that the dangers of moving towards localism, for instance by removing ring fencing on many grants. At a time of acute funding shortages in local authorities, this may mean that air quality action at a local level is cut back. Advisors such as Cassie Harrison at Local Government Regulation (formerly Lacors) have been urging that one way to counteract this is to raise the profile of air quality at a local level. MPs also made this point: demanding a better public understanding of air quality issues.

The government responded: “The Government is reviewing what further action can be taken to communicate the impacts of air pollution more effectively. In particular Government has started a process of more systematic collaboration with other civil society partners at the national level (including environmental and health

● Continued facing page

## COST BENEFIT ANALYSIS

One important committee recommendation was that the Government look at cost effectiveness and not just cost benefits. Many air quality measures are not cost *beneficial* so haven’t been approved even if they are a cost *effective* way of improving air quality.

Here the Government says: “The cost effectiveness of a full range of options will be compared in determining our approach to achieving NO<sub>2</sub> limit values. This will be used to identify the most cost-effective package of measures available to achieve compliance with the NO<sub>2</sub> limit values, in other words in delivering the UK’s obligations at least cost. Implicit in cost effectiveness analysis is the recognition that some technology measures may have costs that exceed benefits, but that relative to other options, they allow targets to be met at least cost.

“Government departments (through the relevant Interdepartmental Group on Costs and Benefits, IGCB) have developed a new approach specifically for use when there are breaches of environmental limits. The IGCB has outlined this approach as best practice appraisal for decisions which may impact on compliance with legally binding obligations and this means that cost effectiveness rather than cost benefit analysis is used. It means that the baseline for any actions to deliver compliance is the range of potential options available to deliver compliance. In order to contribute to the evidence base on the range of technical options to comply with NO<sub>2</sub> limit values, a Marginal Abatement Cost Curve (MAC Curve) approach is being developed to assess a range of technologies on a cost

effectiveness basis. This involves a consideration of the capital, operating and maintenance costs of the technology and the emission savings the technology is expected to deliver. It represents the first application of such an approach. Further work would be necessary though to assess the feasibility of the most cost effective options.

“The IGCB methodology would also help reduce the risk that policies designed to achieve other goals may damage prospects for compliance with air quality limit values. This is because where an intervention may lead to a breach of air quality limits, the associated costs of compliance should be incorporated into the decision-making process. Having developed this best-practice approach, Government is now working across departments to facilitate its integration. This involves both the development of general tools for its application and bespoke analysis consistent with specific departmental guidance.”

MPs had urged that the Government factor in the cost of fines for missing EU targets. In response it said: “Government intends to comply with Community law and to avoid infraction and any fines that could result. Since compliance is a mandatory requirement, our approach is, instead, to address the issue through the use of cost-effectiveness analysis of alternative options to achieve compliance.”

● *Government response to the Environmental Audit Committee report on air quality in the UK* can be viewed on [www.official-documents.gov.uk/document/cm79/7966/7966.pdf](http://www.official-documents.gov.uk/document/cm79/7966/7966.pdf)

LAQM

# Helpdesk contracts confirmed

Contracts have now been signed for the shake up of air quality helpdesk and support arrangements.

Existing consultants have been replaced by new consortia which took over helpdesks from December 1st (*AQB November p1*). There will now be a single LAQM helpdesk replacing three previous helpdesks, and a single contractor carrying out all review and assessment appraisals and action plans.

Bureau Veritas with subcontractors Aecom and NPL will provide management and support services relating to local air quality management. This includes the operation and management of the new LAQM helpdesk and the LAQM webpages.

Transport and Travel Research Limited (TTR) with subcontractors Transport Research Laboratory and Aether are to undertake the appraisal of

local authorities' review and assessment reports and action plans. It is understood that TTR and TRL are entering into a formal relationship as well as working together on this contract.

Defra told *AQB*: "We are looking forward to working with our new contractors on LAQM who have considerable experience in local air quality management and the review and assessment systems."

"We would also offer thanks for the very valuable and important work that colleagues in AEA, Air Quality Consultants and the University of the West of England have carried out with respect to LAQM over the many years they have been involved. Their work has been very valuable in establishing LAQM over the last 10 years and is very much appreciated."

Local authorities should continue to submit air quality

reports (including updates on measures in action plans) via the report submission website and action plans to Defra or the relevant devolved administration and in the case of London to the GLA by email.

Any specific enquiries relating to the appraisal of local authority LAQM reports should be submitted in writing to Defra for onward transmission to the appraisal team. Local authorities should not contact the helpdesk with these queries. All general local air quality management enquiries not relating to the appraisal of local authority reports will continue to be addressed by the helpdesk.

The National Atmospheric Emission Inventory helpdesk is unaffected by these changes.

● Helpdesk contact details have changed and are all now freephone: 0800 0327 953 email: LAQMHelpdesk@uk.bureauveritas.com

IN BRIEF

## Two channel sampler

Monitor firm Enviro Technology is to market the FAI SWAM5a Dual Channel particle device. It claims it is the most flexible particulate measurement system available, is Mcerts approved and meets the criteria for EN12341 and EN14907.

It is a beta-attenuation mass monitor giving 24-hourly means, a gravimetric sampler in accordance with the EU reference methods and measures and samples two channels simultaneously. For example: PM<sub>10</sub> and PM<sub>10</sub> or PM<sub>2.5</sub> and TSP.

ET's Mike Webley said: "The sequential sampler enables up to 36 days unattended operation when set for 24-hour sampling and it can simultaneously sample and measure two size fractions together in one compact instrument. There is even an optional real time module to measure hourly averages if required."

● www.et.co.uk

FROM FACING PAGE

## MPs response (continued)

charities) to establish how we can together give stronger messages about tackling the health impacts of air pollution.

"Government will also encourage local authorities to communicate more strongly to local audiences the health impacts of air pollution and the action that individuals can take to reduce it at the local level, for example through transport choices. The precise way in which such messages should be communicated needs to be a matter for local discretion.

Further communications activity with those that can influence air quality through local communities, local authorities or through business will be very helpful in affecting transport decisions and behaviour. Government will consider how these could be delivered to best effect with local government colleagues and with other agencies. It should be noted that all communications activity will need to take account of spending constraints, including, for example, the limitations on national

campaigning activity announced shortly after coming to power. For that reason, the emphasis will be on targeted activity and collaboration in communications rather than expensive new national campaigning initiatives."

The Government also pointed out that it is shortly to produce a public health white paper which will cover issues such as air quality (*now published, see news, p1*): "The Government will shortly be setting out a radical new approach to public health in a white paper focused on protecting the public from health threats such as environmental hazards, improving the healthy life expectancy of the population, and improving the health of the poorest fastest. Local government will be given powers and dedicated resources to make a major impact on people's health and wellbeing, and directors of public health will be based in local government, jointly appointed with the new Public Health Service."

## Invitation to Tender Notice

Cambridge City Council is inviting tenders for the contract to supply new air quality monitoring instruments (NO<sub>2</sub> and PM<sub>10</sub>), data polling and logging equipment at three of the permanent air quality monitoring stations in Cambridge and an additional instrument to measure PM<sub>2.5</sub> at one of these sites.



Maintenance of the equipment for a period of three years (plus a Council option to extend for up to two additional years) will be included as part of the contract. A maintenance contract for the equipment at our other two permanent air quality monitoring stations (i/ NO<sub>2</sub> and PM<sub>2.5</sub>; and ii/ NO<sub>2</sub>, CO, O<sub>3</sub>), in Cambridge is also required and will be included in the contract.

Potential tenderers are required to complete and return a Pre Qualification Questionnaire (PQQ) in order to be considered to be invited to tender. The closing date/ time for completed PQQ to be received by the Council is Wednesday 12th January at 12 noon. Any PQQ received by the Council after that date/ time will not be considered.

Further information and Pre-Qualification Questionnaire documents will be provided upon request by writing or emailing to:

Anita Lewis  
Refuse & Environment  
Cambridge City Council  
PO Box 700  
Cambridge  
CB1 0JH

(email: anita.lewis@cambridge.gov.uk)

# Cambridge tackles its buses

Many complain that the air quality process has led to little action. Cambridge is bucking the trend in having a plan that might actually work. Jack Pease looks at what is planned

The DfT put it succinctly in a recent conference. If it costs money, it won't happen. Under the new "one in, one out rule", new regulations will be hard to come by (*AQB October p4*).

For local authorities facing their own cuts, without central government help, action on air quality may hit the buffers. And if there is no action, one does wonder whether review and assessments are a waste of time.

One of the key criticisms of the local air quality management process is that even if a local authority takes it seriously (and not all authorities do), then where the problem is caused by traffic, there is little that can be done. This is especially the case with the Highway Agency which is rewarded for moving traffic not improving air quality.

For local roads, lack of control over traffic and political unwillingness to impede drivers means that some authorities produce an action plan with little real hope of any progress being made.

The Low Emission Strategies Partnership was set up a couple of years ago with a view to showcasing best practice and cascading action down to inactive authorities. But given that there has been advice on what should be done in terms of action planning for years, and good examples of action plans, it is unclear whether the problem is lack of advice, or lack of will. If the Government is serious about localism, this could get worse.

Amidst all these depressing thoughts, Cambridge appears to be breaking the mould with a really good idea for tackling emissions in the crowded city centre. As with many city centres, the problem is with buses – and NO<sub>2</sub> emissions that are not going down.

Cambridge's plan is to create an emissions envelope for a city centre area – tot up bus emissions – and then reduce the total emissions year-on-year. Bus operators would be expected to reduce their emissions to keep within that envelope. If operators want to run more buses – then they'll have to find savings elsewhere to make room for the new buses, perhaps by using cleaner vehicles.

The system is simpler than it sounds, and gets round the problems that many city's will recognise – large, incumbent operators with relatively modern fleets and a number of smaller niche operators running older vehicles. Forcing these marginal operators to get new vehicles (for instance by insisting on Euro 3 or above) can put them out of business and have political implications, and can act as a barrier to new entrants and risks strangling competition which supposedly keeps fares down.

The emissions envelope is also relatively

easy to implement and does not require money. Cambridge's rival Oxford has a problem with its buses and is tackling it through an attempt at implementing a low emission zone within its Oxford Transport Strategy (*AQB July 2009 p2*). Years of battles between the county highway authority and city council delayed the agreement, which will no doubt now be further delayed with the squeeze on council funding.

Back to Cambridge, air quality officer Jo Dicks outlined the plans to the most recent Cerc ADMS user group meeting. The city council is working with Cerc to model the implications of the proposals which is being included in the latest (third round) proposed local transport plan.

"Cambridge is a thriving and growing city and planned growth will see it expand its housing and population by over 30% over the next 15 years. In terms of bus provision and patronage it has in recent years bucked the national trend with the expansion of both park and ride services and ordinary services. Bus use increased by 21% between 2001 and 2006; radial route bus use in Cambridge increased by 40%, Cambridge is a small city which has a well known housing shortage, lack of space for parking means that there is a high proportion of trips to the centre made by walking cycling and public transport."

This has been buoyed by numerous streets becoming off-limits to cars, some controlled by rising bollards. There is an irony that 20 years ago Cambridge was the first UK city to seriously consider road pricing, that proved politically unpopular, so instead the highway authority has gradually closed streets which achieves the same aim, albeit more bluntly.

But getting rid of cars from the city centre does not get rid of the air quality problem, as modern cars are pretty clean, whereas buses are not. It is well known across the UK that even modern Euro 5 buses may be far cleaner in terms of PM<sub>10</sub>, but are not making similar inroads into NO<sub>2</sub>. Indeed, there is evidence from Kings College London that while NO<sub>x</sub> for new vehicles is down, the increased proportion of NO<sub>2</sub> may be the reason why many city centre locations near bus routes are seeing static or even rising concentrations of NO<sub>2</sub>.

So despite banning cars from city centre streets, Cambridge still has an NO<sub>2</sub> problem. Dicks said: "Long term detailed monitoring of NO<sub>2</sub> and PM<sub>10</sub>, coupled with detailed modelling, led to the declaration of an air quality management area in central Cambridge in August 2004. A further assessment unsurprisingly established that nearly 50% of the experienced NO<sub>2</sub> pollution in the bus station area was directly

emitted from local buses, with an additional contribution from indirect bus emissions in the urban background. This led in turn to a policy focus on bus emissions through air quality actions included in the second Cambridgeshire Local Transport Plan 2006-2011."

Air quality concentrations from the city's continuous monitor in Parker Street (near the bus station) show NO<sub>2</sub> at levels 20-25% above EU limit values and national objectives. Data from diffusion tubes in nearby Emmanuel Street, Emmanuel Road and St Andrews Street record even higher concentrations.

Dicks continued: "Following declaration of the AQMA in August 2004, air quality improvement measures were proposed by the City Council for inclusion in the County Council's LTP2 document, which was finalised in 2005. These included a minimum emission standard for buses as well as measures aimed at maintaining current traffic flows.

City council air quality officers recommended a minimum Euro 3 standard for all buses using the core area of Cambridge by January 2009 and Euro 4 standard by January 2011. City officers also proposed the option of buses of Euro 2 standard to be retrofitted with abatement technology to meet an improved standard, as evidenced through a Reduced Pollution Certificate. This gave the operators flexibility in meeting the required standard.

To meet these targets a Quality Bus Partnership was proposed, however prolonged negotiations over emissions standards meant that all partners only signed up to the agreement by late 2008. These negotiations between county council officers and bus operators led to the adoption of the lower standard of 90% buses in the core area to be Euro II+RPC by January 2009 in the text of LTP2 but with an even lower standard of 90% Euro II as a headline target.

A subsequent LTP2 progress report from the county informed DfT that a further standard of 90% of buses to be Euro III by January 2011 would be enforced but this standard has not as yet been formalised by



**Cambridge bus gate**



**New services will be set against emission improvements elsewhere**

the county council nor incorporated in to the Quality Bus Partnership agreement.

“This wasn’t as good as it could be but still tough for some smaller operators. Whilst the Quality Bus Partnership has delivered some fleet improvement over the plan period it has been coupled with a rise in the number and frequency of services between 2006 and 2008 and therefore very little improvement in ambient levels of NO<sub>2</sub> have been observed in the monitoring data until very recently. This has led us to take a more proactive and flexible approach, which sets more demanding targets at the same time.”

Cambridge says that following a slow start to implementation of bus improvements it was agreed that operators would, in addition to meeting the minimum 90% Euro II standard and submit an annual ‘Fleet Improvement Plan’ showing how they intend to invest over the coming year to improve the level of emissions of pollutants of concern. The first of these plans were submitted in mid 2009 and form the basis of emission improvement estimates (see table, below).

Of the new plan Dicks says: “The plan sets out a more flexible, reasoned and ambitious approach to tackling the poor air quality situation in the core area of Cambridge. The plan is to reduce direct bus emissions of NO<sub>x</sub> within the existing core scheme area by 50% by 2015 based on a 2008 baseline. This will be achieved by setting a reducing emission cap for the core area annually, to which all operators using the area will commit to meeting.

Fleet Improvement Plans already agreed through the Quality Bus Partnership Agreement will be submitted annually and in advance which respond to the emission caps set out. Operators will continue to provide actual fleet data as required by the quality bus partnership agreement twice a year.

The proposal also aims to continue to raise the minimum emission standard for buses using the core area infrastructure by progressively raising the Euro standard of buses granted access. The current Euro 2 standard will be raised at stated intervals until air quality reaches European standards for health, starting with a minimum of 90% of vehicles to be Euro 3 standard or better by January 2011 in line with the current

Local Transport Plan. A future standard for implementation of 75% Euro 4 will also be considered for 2013 and 90% Euro 4 by January 2015.

However those bus operators who are working within their NO<sub>x</sub> budgets under the commitment will be exempt from these minimum standards and thereby benefit from greater flexibility when planning and operating their fleet.

The process will be reviewed annually with feedback to bus operators and members on progress and supported by air quality monitoring information gathered by the city council.

Detailed source apportionment work – that is looking at all of the direct, local sources of emissions at a given location – was carried out following declaration of the air quality management area. The work was focussed on two locations, the bus station area and at the junctions on the inner ring road.

Results showed that of the measured NO<sub>2</sub> pollution within the bus station area approximately 50% was directly attributable to local bus emissions. At the ring road locations 25-30% of NO<sub>2</sub> experienced is directly attributable to local bus emissions

Detailed calculations of emissions within the core area have been carried out for 2008, 2009 and for the fleet proposals in operator Emission Improvement Plans for 2010. This has been done by looking at the route distances, Euro standard of the operational fleet and frequency for each service operating in the core area. A weekly tonnage of NO<sub>x</sub> has then been calculated using the latest government emission factors published in 2008. An average fleet speed of 15mph has been assumed for these calculations.

Using the total NO<sub>x</sub> emissions within the core area envelope in 2008 as a base line figure incremental emission tonnages will be set for the years 2010 through to January 2015 based on a final January 2015 value set at 50% of the 2008 value.

Headline emissions targets will need to be met every year but this may not mean investment by all companies in all years. Indeed, for those operators who have made early investment further action may not be

required until later years, if at all. For those operators who have yet to make the necessary investment or operational changes more action will be required. Any shortfall in one year will not affect the required NO<sub>x</sub> tonnage reduction in subsequent years but will increase the amount of action required in subsequent years.

New operators will need to be incorporated within the overall NO<sub>x</sub> budget ie. the headline NO<sub>x</sub> budget will not be raised to incorporate a new operator. If a new operator takes over an existing route from a current operator who ceases to operate then this will not be a problem the relevant budget will move with the route.

If however a new operator wishes to provide a new route in addition to existing routes then an operator will be allocated a budget based on a formula based on average emission targets.

Each operator will be provided with an, Excel based, calculation tool, ready populated with their current fleet and their annual emission budget. Within the tool changes to service frequency, Euro Standard, routing distance etc. will be possible and weekly emissions will automatically be calculated. This will make reviewing fleet and management changes very simple.

Dicks concluded: “This emission reduction commitment represents a realistic and deliverable way to reduce the health impact from bus derived air pollution in a sensitive and growing city. It is however challenging, and should be a source of pride and good publicity to those operators prepared to meet the challenge. It is our intention to reduce NO<sub>2</sub> concentrations over the period to 2015 to levels acceptable under national and European legislation whilst at the same time maintaining and growing the bus services available to the population of Cambridge and beyond and giving maximum flexibility to operators in the management of their fleets.”

Cerc carried out the modelling to investigate the effects of the emissions cordon using ADMS-Urban and EMIT. It modelled two scenarios – a 2008 baseline and a 2015 scenario with reduced emissions. It revealed an average percentage decrease of 25% annual mean NO<sub>2</sub> at monitor locations around the bus station, and 10% reduction further out.

## Headline emission reduction targets 2008-2015

Using the total NO<sub>x</sub> Emissions within the core area envelope in 2008 as a base line figure incremental emission tonnages will be set for the years 2010 through to January 2015 based on a final January 2015 value set at 50% of the 2008 value.

Year	2008	2009	2010	2011	2012	2013	2014	2015
%NO <sub>x</sub> emission reduction	Baseline	10	10	7.5	7.5	5	5	5
Required NO <sub>x</sub> emissions grams/week	287160	258444	229728	208191	186654	172296	157938	143580

## IN BRIEF

### Airport monitored

Tubes have been used in a bid to see whether there is elevated NO<sub>2</sub> near an airport.

The monitoring and land use regression was used on T.F. Green Airport in Eastern USA). 644 measurements were collected over three sampling campaigns. Higher NO<sub>2</sub> was seen near the airport terminal, entrance roads to the terminal, and major roads.

**Nitrogen dioxide concentrations in neighborhoods adjacent to a commercial airport: a land use regression modeling study,** Gary Adamkiewicz et al, *Environmental Health* 2010, [www.ehjournal.net](http://www.ehjournal.net)

### Biogenic VOCs

Biogenic (naturally occurring) volatile organic compounds can be controlled if man made anthropogenic emissions are controlled.

North Carolina researchers point out that man made pollution facilitates transformation of biogenic VOCs into secondary aerosol – up to 50% of biogenic secondary organic aerosol could be controlled by reducing man made emissions.

**To what extent can biogenic secondary organic aerosol be controlled?** Annmarie Carlton et al, *Environmental Science & Technology*, 2010, Vol. 44 no 9 pp 3376-3380.

### Smoking ban cuts PM

The smoking ban has reduced particle exposure in UK bars. Air quality was measured in 106 randomly selected bars across the UK before and after smoking restrictions were introduced.

PM<sub>2.5</sub> levels prior to the ban were highest in Scotland (median 197µg/m<sup>3</sup>) followed by Wales (184µg/m<sup>3</sup>) and England (92µg/m<sup>3</sup>). The median reduction ranged from 84% – 93%. There was evidence that PM exposure in more deprived postcodes was higher prior to the ban.

**UK smoke free legislation: changes in PM<sub>2.5</sub> concentrations in bars in Scotland, England and Wales,** Sean Semple et al, *Annals of Occupational Hygiene*, Vol. 54 no 3 pp272-280.

## FIREWORKS

# Particles from fireworks

Firework displays lead to high exposures of fine particles for those in the crowd and living nearby, Canadian researchers suggest.

Tests of PM<sub>2.5</sub> levels and elemental content were carried out during the nine launches of the 2007 Montreal International Fireworks Competition. Personal samplers and fixed site elemental samplers were used and positioned in the likely

plume of the firework event, estimated using meteorological forecasting.

Researchers say: “The highest PM<sub>2.5</sub> levels reached nearly 10,000µg/m<sup>3</sup>, roughly 1,000 times background levels. Elements such as potassium, chlorine, aluminium, magnesium and titanium were markedly higher in plume-exposed filters. This study shows that persons in the plume

may be exposed to extremely high levels of PM<sub>2.5</sub> for the duration of the display and the plume contains specific elements for which little is known of their acute cardio respiratory toxicity.”

**Characterisation of particulate exposure during fireworks displays,** Alexandre Joly et al, *Atmospheric Environment* Vol. 44 (2010) pp 4325-4329.

## ...and more firework emissions

US researchers have also studied firework emissions and found that exposures can exceed occupational standards.

Using both monitoring and modelling, using emission factors developed through controlled burning, they found that total particulate matter, copper and sulphate exposures exceeded occupational health guidelines at two outdoor performances.

Researchers commented: “This study shows that ground level pyrotechnics generate

airborne contaminants at levels which could be a health hazard. Individuals near to the pyrotechnics are especially at risk where SO<sub>2</sub> exposure exceeded the threshold for bronchoconstriction in asthmatics based on personal air monitoring at two performances.

“Emission factors for seven pyrotechnics indicated that many metals, including barium, strontium, copper and lead, as well as known respiratory irritants, were at levels exceeding occupational

guidelines. Beryllium, which is extremely hazardous, has not previously been found in fireworks and should be quantified in future work.”

They add that either workers should wear respiratory equipment, or better that fireworks generate lower levels of hazardous contaminants.

**Emission factors and exposures from ground level pyrotechnics,** Gerry Croteau et al, *Atmospheric Environment*, Vol. 44 (2010) pp3295-3303.

## Maltese fireworks kick up a stink

Firework smoke in Malta may be of concern to health.

Maltese researchers studied three day fiestas where fireworks are let off at ground level and in the sky. Samples were collected in an urban area of Malta and a relatively rural

island nearby during two periods when there were a lot of fiestas and fewer fiestas.

They found very high levels of elements such as aluminium, barium, Cu and strontium – with PM<sub>10</sub> levels exceeding those found at Marylebone

Road in London. They say presence of Barium and strontium are a health concern.

**Effect of fireworks on ambient air quality in Malta,** Renato Camilleri et al, *Atmospheric Environment* Vol. 44 (2010) pp4521-4527.

## King's picks up fireworks' oxidative burden

Firework-derived particles appear to have more oxidative potential than traffic source particles, say Kings College London researchers

Particle samples were collected from the Marylebone Road site in London and tested for various parameters including oxidative potential and trace metals.

Pyrotechnic combustion events were characterised by increased gas phase pollutants levels (NO<sub>x</sub> and SO<sub>2</sub>), elevated particulate mass concentrations,

and trace metal concentrations (specifically Sr, Mg, K, Ba, and Pb).

Relationships between NO<sub>x</sub>, benzene, and PM<sub>10</sub> were used to apportion firework and traffic source fractions. A positive significant relationship was found between PM oxidative burden and individual trace metals associated with each of these apportioned source fractions.

Researchers said: “From the current study it was not clear if the measured pyrotechnic

particulate trace metals were the drivers for the measured oxidative potential or simply represent surrogates for some unmeasured components.

“We recommend further examination of a possible relationship between firework exposure and acute respiratory outcomes.”

**Particulate oxidative burden associated with firework activity,** Krystal Godri et al, *Environmental Science and Technology* 2010, Vol. 44 pp8295-8301.

**TRAFFIC POLLUTION**

# Traffic may prompt breast cancer

Researchers have found a connection between air pollution and breast cancer using detailed air pollution maps

Data from a number of studies were combined. First, they used the results of a 2005-2006 study to create two air pollution “maps” showing levels of nitrogen dioxide in different parts of Montreal in 1996 and for a period 10 years earlier in 1986.

This was compared with the

home addresses of women diagnosed with breast cancer in the relevant time period.

Researchers said: “The incidence of breast cancer was clearly higher in areas with higher levels of nitrogen dioxide which is a known marker for traffic-related air pollution.”

Montreal had levels of between 5 ppb to over 30 ppb. The risk increased by 25% per 5ppb, or put another way, women living in the areas with the highest levels of pollution

were almost twice as likely to develop breast cancer as those living in the least polluted areas.” But researchers warn that NO<sub>2</sub> is only a marker of other pollutants which may be carcinogenic.

**Postmenopausal breast cancer is associated with exposure to traffic-related air pollution in Montreal, Canada: A case-control study. Dan Crouse et al. *Environmental Health Perspectives*, 2010; DOI: 10.1289/ehp.1002221**

**PERSONAL EXPOSURE**

# Cycling bad for your health?

Cycling in busy traffic may increase inflammatory blood cells in health subjects.

To address this conundrum, researchers investigated if a bicycle journey along a busy commuting road would induce changes in biomarkers of pulmonary and systematic inflammation in a group of healthy subjects.

38 volunteers (mean age: 43, 26% women) cycled for about 20 minutes in real traffic near a major bypass road (road test; mean UFP exposure: 28,867 particles per cm<sup>3</sup>) in Antwerp and in a laboratory with filtered air (clean room; mean ultra fine particle exposure: 496 particles

per cm<sup>3</sup>). The exercise intensity (heart rate) and duration of cycling were similar for each volunteer in both experiments. Exhaled nitric oxide (NO), plasma interleukin-6 (IL-6), platelet function, Clara cell protein in serum and blood cell counts were measured before and 30 minutes after exercise.

The percentage of blood neutrophils increased significantly more after exercise in the road test (3.9% to 6.2%) than after exercise in the clean room (0.2%-2.2%). Researchers said that the health significance of this isolated change is unclear.

They added: “Numerous

epidemiological studies have demonstrated adverse health effects of a sedentary life style, on the one hand, and of acute and chronic exposure to traffic-related air pollution, on the other.

“Because physical exercise augments the amount of inhaled pollutants, it is not clear whether cycling to work in a polluted urban environment should be encouraged or not.”

**Subclinical responses in healthy cyclists briefly exposed to traffic-related air pollution: an intervention study, Lotte Jacobs et al, *Environmental Health* 2010, 9:64 www.ehjournal.net**

**ACTION PLANNING**

# Road sweeping doesn't work?

Dutch researchers have found that road sweeping doesn't cut particle levels.

Road sweeping and washing is currently being trialled by Transport for London in a bid to reduce particle concentrations in London hotspots (see news, page 2).

Researchers noted that in Holland, the coarse fraction (PM<sub>10-2.5</sub>) contributed 60% and 50% respectively to regional and urban increments of PM<sub>10</sub>. Unlike in Scandinavian and

Mediterranean countries, the level remains relatively constant throughout the year.

Researchers say: “Chemical analysis indicates that mainly resuspension of deposited particulate and a limited amount of road wear are the main sources of non exhaust particles. Tyre wear particles are predominantly in the fine fraction while brake wear mainly in the coarse fraction.

Monitoring in Amsterdam and Rotterdam took place following

road sweeping and washing, but results showed that washing (or rainfall) did not significantly remove deposited PM from the road but they warned this could be a feature of the flat terrain found in Holland.

**Non-exhaust emissions of PM and the efficiency of emission reduction by road sweeping and washing in the Netherlands, Menno Keuken et al, *Science of the Total Environment*, Vol. 408 (2010) pp4591-4599.**

**SCIENCE SHORTS**

**Blood impact**

Long-term residential exposure to fine particles can lead to thickening of blood vessels (increased carotid intima-media thickness (CIMT)) say German researchers.

Data from the HNR (Heinz Nixdorf Recall) study, a population-based cohort of 4,814 participants, 45 to 75 years of age was compared to residential long-term exposure to PM with a chemistry transport model and measured distance to high traffic.

Researchers concluded: “Our study shows a clear association of long-term exposure to PM<sub>2.5</sub> with atherosclerosis. This finding strengthens the hypothesised role of PM<sub>2.5</sub> as a risk factor for atherogenesis.”

**Urban particulate matter air pollution is associated with subclinical atherosclerosis: results from the HNR (Heinz Nixdorf Recall) study, Marcus Bauer et al *Journal of the American College of Cardiology* Vol. 56, No.22, pp1803-1808.**

**DNA link**

Toll-like receptor 2 and 4 genes (TLR2 and TLR4) have been found to influence the susceptibility to adverse effects of traffic-related air pollution with respect to the prevalence of childhood asthma.

**Toll-like receptor 2 and 4 genes influence susceptibility to adverse effects of traffic-related air pollution on childhood asthma, M Kerkhof et al, *Thorax*. 2010 Aug; 65(8): pp 690-7.**

**Brain effects**

Tests on rats have shown that diesel exhaust affects different parts of the brains in different ways.

**Effect of prolonged exposure to diesel engine exhaust on proinflammatory markers in different regions of the rat brain M Gerlofs-Nijland et al, *Particle and Fibre Toxicology*. 2010 Vol. 17; pp7:12.**

Well we think he's great, now there's third-party confirmation of the hero status of Simon Birkett – air quality campaigner and Campaign Hero.

The latter tag was given to Birkett by *The Ecologist* magazine. Birkett is far too modest to mention it on his own website, so we'll embarrass him here!

One way of dodging a question in Parliament is to answer a slightly different one, so avoiding a real answer.

Lord Brooke asked the Government: "how they are informing people living in London areas with high traffic congestion of the consequent risks to their health".

Health minister Earl Howe replied: "The department does not provide advice on the effects of air pollutants on health on a location-specific basis. There is no reason to think that the effects of exposure to traffic-generated air pollutants on health in London would be qualitatively different from those in Birmingham." Non-answer or what!

You can see why Port Talbot residents might be a bit hacked off.

Having lived for years in the shadow of the steelworks which prompted one of the few industrial PM<sub>10</sub> air quality

management areas, the area was subject to four applications for biomass burning power stations.

One particularly hotly-fought burner was the Prenergy 350MW. Even before it has been built, developers have now asked to vary their permit to allow increased emissions. This might very well be seen as an exercise in getting the foot in the door....

Joined up Government?

You may recall that recently Defra reigned in various websites so that they could be held on Defra's central air quality website. Many user-friendly URL's and useful sites ended up lost in Defra's bland and awful site with a complicated URL. At the time this was part of the Government drive to rationalise its websites and save money.

So it comes as some surprise to find Comeap doing quite the opposite. From having an awful site lost within DoH blandness with a gobbledegook URL, it has now been relaunched, looks good and has the very friendly URL <http://comeap.org.uk>.

Here's a heart-warming story to get us in to the spirit of Christmas.

There's something rather charming about tugboats, especially one not belching clouds of black smoke.

A new study sponsored by the Californian Air Resources Board has confirmed that hybrid technology can be used as successfully for tugboats as it has been for cars, buses and trucks.

It studied a Long Beach/Los Angeles port hybrid tugboat with four diesel engines and 126 batteries. It cut soot by 73% and NO<sub>x</sub> by 51%. The twin ports are the single largest polluter in the area.

*Seasons Greetings* to our readers, here's hoping that the outlook for the economy generally and environmental health in particular will improve in 2011.



## AIR QUALITY EVENTS 2010/11

**13th December**

### INVESTIGATION OF AIR POLLUTION STANDING CONFERENCE

Iapsc meeting to be held at the Council House, Birmingham. [www.iapsc.org.uk](http://www.iapsc.org.uk)

**13th December**

### CREATING LOW EMISSION TRANSPORT OPTIONS FROM DEVELOPMENT PLANNING

Joint RTPI / Sussex-Air / Low Emission Strategies seminar, free, to be held at Gatwick. To register visit [www.rtpi.org.uk/ct/EVENT/1193/11/events/1193](http://www.rtpi.org.uk/ct/EVENT/1193/11/events/1193)

**14-15th December**

### MONITORING AMBIENT AIR 2010: NEW AIR QUALITY

Measurement Technologies, AAMG conference to be held at the Royal Society of Chemistry London. <http://rsc-aamg.org>

**2011**

**10th-11th May 2011**

### INDOOR AND OUTDOOR AIR POLLUTION RESEARCH MEETING

Annual meeting to be held at Cranfield, Bedfordshire. Institute of Environment and Health website [www.cranfield.ac.uk/health/researchareas/environmenthealth/ieh](http://www.cranfield.ac.uk/health/researchareas/environmenthealth/ieh)

**September 2011**

### HOW TO SEARCH FOR CO-BENEFITS AND AVOID TRADE-OFFS

in local air pollution and climate change policies? Hosted by APPA, in France, [www.appa.asso.fr](http://www.appa.asso.fr).

**24th - 27th October 2011**

### AIR QUALITY EIGHT

to be held in Arlington, Virginia, USA [www.undeerc.org/AQ8/](http://www.undeerc.org/AQ8/)

**26th-27th May**

### EFCA-SYMPOSIUM: ULTRAFINE PARTICLES 3

Hosted by GUS, in cooperation with Forschungszentrum Karlsruhe and CEEES. website <http://efca.net/>

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# AIR QUALITY

BULLETIN

## CARBON REDUCTION BULLETIN #6

We are on our sixth issue of our supplement covering carbon and how to cut it. *Carbon Reduction Bulletin* is aimed at people who need to know how others are tackling carbon reduction.

*Jack Pease*

